



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
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May 20, 2022

SENT VIA EMAIL

Alan Wilson, Attorney General
State of South Carolina
P.O. Box 11549
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Myra Reece, Director
Environmental Affairs
South Carolina Department of Health and Environmental Control
2600 Bull Street
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Dear Attorney General Wilson and Director Reece:

On October 18, 2021, the EPA received a Notice of Intent to bring suit from the Southern Environmental Law Center, on behalf of American Rivers and Upstate Forever, alleging that the EPA had a mandatory duty to review the South Carolina Surface Water Withdrawal, Permitting, Use and Reporting Act of 2010 (SCWWA), S.C. Code Ann. §49-4-10 and its implementing regulations, S.C. Code Ann. Regs. §61-119 (R.61-119), for consistency with the Clean Water Act (CWA) and 40 C.F.R. Part 131.

The EPA has examined the SCWWA and R.61-119 in their entirety to determine whether any of the provisions constitute new or revised WQS under the CWA and EPA regulations, as informed by EPA guidance. As a result of this review, the EPA has determined that certain of the provisions are new WQS and are therefore subject to the Agency's review under Section 303(c) of the CWA and 40 C.F.R. Part 131. The EPA has the authority and duty to approve or disapprove these new WQS under the CWA Section 303(c)(3) because they are legally binding upon the state; address water quality criteria; set the desired condition for waterbodies in South Carolina; and are new WQS that have not been previously reviewed by the EPA under section 303(c).

The provisions that the EPA has concluded are new WQS are:

- S.C. Code Ann. §§ 49-4-20(14) and 49-4-150(A)(3) and S.C. Code Ann. Regs. §§ 61-119 section B(18) and section E(3)(a)(i)(B) Minimum instream flows;
- S.C. Code Ann. § 49-4-20(15) and S.C. Code Ann. Regs. § 61-119 section B(19) Minimum water levels;
- S.C. Code Ann. § 49-4-20(25) and S.C. Code Ann. Regs. § 61-119 section B(29) Safe yield; and,
- S.C. Code Ann. Regs. § 61-119 section E(3)(a)(ii)(A-D) Safe yield.

As discussed in the enclosed document, titled *Decision Document of the United States Environmental Protection Agency Review of the South Carolina Surface Water Withdrawal, Permitting, Use and Reporting Act of 2010 and S.C. Code Ann. Regs. §61-119 Under § 303(c) of the Clean Water Act*, the EPA has reviewed these new WQS to determine whether they meet the requirements for approval in Section 303(c) of the CWA and 40 C.F.R. Part 131, has found that these provisions are not consistent with applicable legal requirements, and therefore disapproves the new WQS. Specifically, these provisions are not based on a sound scientific rationale as required by 40 C.F.R. § 131.5, do not protect the state's designated uses as required by 40 C.F.R. § 131.11, and do not provide for the attainment and maintenance of downstream WQS as required by 40 C.F.R. § 131.10. Accordingly, these provisions are not in effect for any CWA purposes and cannot be used for any CWA purposes even though they remain effective for state law purposes. For instance, these provisions cannot be used when issuing CWA Section 401 certifications in association with Section 404 permits, Federal Energy Regulatory Commission licenses, or other reviews requiring Section 401 certification. These provisions also cannot be used for water quality decisions under Section 303(d) and 305(b), Section 402 permitting, or for any other purposes under the CWA. Please note that these provisions should not be referred to as WQS. For instance, referring to the provisions as "protective stream flow criteria," or "flow standards," may create confusion and give the impression that the provisions are WQS that may be used for CWA purposes.

To remedy the Agency's disapproval and protect the state's designated and existing uses, South Carolina must take prompt action to develop protective hydrologic criteria during the current 2022 Triennial Review (CWA section 303(c)(3) and 40 CFR 131.22). Once those new water quality standards are in place, they must be implemented in conjunction with South Carolina Department of Health and Environmental Control's EPA-approved WQS under R.61-68 and 69 for all CWA purposes.

The EPA welcomes the opportunity to work with the state on the development of protective hydrologic criteria consistent with the CWA and 40 C.F.R. Part 131. The State should consider relevant Agency guidance when developing these criteria. The EPA is also available, if needed, to assist the State in the development of procedures to implement the new WQS.

Should you have any questions regarding this decision, please contact me at (404) 562-8357. If your staff has any questions, please contact Ms. Lisa Perras Gordon, at (404) 562-9317 or gordon.lisa-perras@epa.gov.

Sincerely,

Daniel Blackman
Regional Administrator

cc: Shawn Clarke, SC DHEC
Brenda Green, SC DHEC
Andrew Edwards, PE, SC DHEC

***Decision Document of the United States Environmental Protection Agency
Review of the South Carolina Surface Water Withdrawal, Permitting, Use and
Reporting Act of 2010 and S.C. Code Ann. Regs. Section 61-119 Under Section 303(c)
of the Clean Water Act***

The EPA has reviewed the South Carolina Surface Water Withdrawal, Permitting, Use and Reporting Act of 2010 (SCWWA), S.C. Code Ann. section 49-4-10 *et seq.* and its implementing regulation, S.C. Code Ann. Regs. section 61-119 (R.61-119), for consistency with the Clean Water Act (CWA) and 40 CFR Part 131. The EPA examined the SCWWA and R.61-119 to determine whether any provisions are new or revised water quality standards (WQS) that the EPA has the authority and duty to approve or disapprove under the CWA section 303(c)(3). As a result of that review, the EPA has determined that some provisions in the SCWWA and R.61-119 are new WQS. The EPA then reviewed those provisions for consistency with the CWA and the Agency's implementing regulations and found that they are not consistent with the requirements of the CWA and 40 CFR Part 131. Specifically, they are not based on a sound scientific rationale as required by 40 CFR sections 131.5 and 131.11, do not protect the State's designated uses as required by 40 CFR section 131.11, and do not provide for the attainment and maintenance of downstream WQS as required by 40 CFR section 131.10. Therefore, the EPA is disapproving those provisions pursuant to the CWA section 303(c), as detailed below, and they cannot be used for any CWA purpose.

I. Step 1. Review of SCWWA and R.61-119 to Determine Whether Provisions Are New or Revised WQS

The EPA has determined that some provisions in the SCWWA and R.61-119 constitute new WQS that the Agency has the authority and duty to approve or disapprove under section 303(c)(3) of the CWA. In brief, these provisions constitute new WQS within the meaning of section 303(c) of the CWA and under the EPA's regulation because they are legally binding upon the State; address water quality criteria; set the desired condition for waterbodies; and are new WQS that have not been previously approved by the EPA under section 303(c).

A. South Carolina's Existing WQS

WQS articulate the water quality goals of a water body by designating the use(s) and setting the criteria to protect those use(s). States adopt WQS to protect public health, enhance the quality of water, and serve the purposes of the CWA. WQS provide water quality for the protection and propagation of fish, shellfish and wildlife and recreation in and on the water, wherever attainable, and take into consideration the use and value of waters for public water supplies, agricultural, industrial, and other purposes including navigation. *See* 40 CFR section 131.2. Criteria are defined as elements of WQS "expressed as constituent concentrations, levels, or narrative statements, representing a quality of water that supports a particular use. When criteria are met, water quality will generally protect the designated use." 40 CFR section 131.3(b).

The South Carolina Department of Health and Environmental Control's (SCDHEC or Department) EPA-approved WQS articulate in part that it is the purpose of the WQS to "establish a system and rules for managing and protecting the quality of South Carolina's surface...water" (R.61-68(A)(1)). The SCDHEC WQS also state that "[n]umeric criteria for aquatic life and human health are numeric values for specific parameters and pollutants or water quality levels which have been assigned for the

protection of the existing and classified uses,” which include Freshwaters, Trout Waters, Outstanding Resource Waters, Outstanding National Resource Waters, Shellfish Harvesting Waters, Class SA, and Class SB waters. The State’s narrative criteria for aquatic life and human health are “...goals and statements of attainable or attained conditions of biological integrity and water quality of the waterbody” (R.61-68(A)(1)(b)). The State’s antidegradation rules provide, “a minimum level of protection to all waters of the State and also include provisions and requirements necessary to determine when and if water quality degradation is allowed” (R.61-68(A)(1)(c)). South Carolina’s WQS seek to maintain water quality for waters which meet WQS, and where possible, improve water quality for waters that do not meet WQS, and emphasize “...a preventive approach in protecting waters of the State” (R.61-68(A)(2)-(3)).

The EPA-approved SCDHEC WQS at R.61-68 include the following provisions:

A.4. It is a goal of the Department to maintain and improve all surface waters to a level to provide for the survival and propagation of a balanced indigenous aquatic community of flora and fauna and to provide for recreation in and on the water.

B.12. Balanced indigenous aquatic community means a natural, diverse biotic community characterized by the capacity to sustain itself through cyclic seasonal changes, presence of necessary food chain species and by a lack of domination by pollutant tolerant species.

B.19. Biological criteria, also known as biocriteria, mean narrative expressions or numeric values of the biological characteristics of aquatic communities based on appropriate reference conditions. Biological criteria serve as an index of aquatic community health.

F.1.a. Narrative biological criteria in Section A.4. describe the goals of the Department to maintain and improve all surface waters to a level that provides for the survival and propagation of a balanced indigenous aquatic community of fauna and flora. These narrative criteria are determined by the Department based on the condition of the waters of the State by measurements of physical, chemical, and biological characteristics of the waters according to their classified uses.

F.1.e. In the Class Descriptions, Designations, and Specific Standards for Surface Waters Section, all water use classifications protect for a balanced indigenous aquatic community of fauna and flora. In addition, Trout Natural and Trout Put, Grow, and Take classifications protect for reproducing trout populations and stocked trout populations, respectively.

G. Class Descriptions, Designations, and Specific Standards for Surface Waters

4. Outstanding National Resource Waters (ONRW) are freshwaters or saltwaters which constitute an outstanding national recreation or ecological resource.

6. Outstanding Resource Waters (ORW) are freshwaters or saltwaters which constitute an outstanding recreational or ecological resource or those freshwaters suitable as a source for drinking water supply purposes with treatment levels specified by the Department.

8. Trout Waters including Natural; Put, Grow, and Take; and Put and Take.

10. Freshwaters are freshwaters suitable for primary and secondary contact recreation and as a source for drinking water supply after conventional treatment in accordance with the requirements of the Department. Suitable for fishing and the survival and propagation of a balanced indigenous aquatic community of fauna and flora. Suitable also for industrial and agricultural uses.

11. Shellfish Harvesting Water are tidal salt waters protected for shellfish harvesting and uses listed in Class SA and Class SB. Suitable for primary and secondary contact recreation, crabbing, and fishing. Also suitable for the survival and propagation of a balanced indigenous aquatic community of marine fauna and flora.

12. Class SA are tidal salt waters suitable for primary and secondary contact recreation, crabbing, and fishing, except harvesting of clams, mussels, or oysters for market purposes or human consumption and uses listed in Class SB. Also suitable for the survival and propagation of a balanced indigenous aquatic community of marine fauna and flora.

13. Class SB are tidal salt waters suitable for primary and secondary contact recreation, crabbing, and fishing, except harvesting of clams, mussels, or oysters for market purposes or human consumption. Also suitable for survival and propagation of a balanced indigenous aquatic community of marine fauna and flora. Class SB has a less stringent criterion for dissolved oxygen than Class SA.

B. Analysis of Whether Provisions of the SCWWA and/or R.61-119 Are New or Revised WQS

CWA section 303(c)(2) requires states to submit new or revised WQS to the EPA. CWA section 303(c)(3) provides for the EPA review of such WQS. In this case, South Carolina did not submit the SCWWA or R.61-119 to the EPA for review. The EPA's authority and duty to review and approve or disapprove a new or revised WQS is not dependent upon whether the provision was submitted to the EPA for review.¹ Therefore, the EPA analyzed the SCWWA and R.61-119 to determine whether they contained any new or revised WQS.

In October 2012, the EPA posted a document online, entitled: "*What is a New or Revised Water Quality Standard Under CWA 303(c)(3)? Frequently Asked Questions*" (FAQs).² The EPA developed the document as an aid to discern when state provisions constitute new or revised WQS, stating: "To date, the EPA has evaluated each situation on a case-by-case basis. These FAQs consolidate the EPA's plain language interpretation (informed by the CWA, the EPA's implementing regulation at 40 CFR part 131, and relevant case law) of what constitutes a new or revised water quality standard that the Agency has the CWA section 303(c)(3) authority and duty to approve or disapprove." The FAQs were, in part, an outgrowth of the Agency's experience in prior cases, and they are currently referenced in the EPA's *Water Quality Standards Handbook*. EPA's FAQs describe a 4-part test: if all four questions are

¹ The 11th Circuit has held that the EPA has a mandatory duty to act on new or revised state WQS, whether or not they are submitted to EPA. *Miccosukee Tribe of Indians of Florida v. EPA*, 105 F.3d 599 (11th Cir. 1997); *FPIRG v. EPA*, 386 F.3d 1070 (11th Cir 2004) (concurring with the reasoning in *Miccosukee*).

² *What is a New or Revised Water Quality Standard Under CWA 303(c)(3)? Frequently Asked Questions*. Office of Water, U.S. Environmental Protection Agency. EPA No. 820-F-12-017 (October 2012)
<https://www.epa.gov/sites/default/files/2014-11/documents/cwa303faq.pdf>

answered “yes,” then the provision would likely constitute a new or revised WQS that the EPA has the authority and duty to approve or disapprove under CWA section 303(c)(3).

The EPA analyzed the SCWWA and R.61-119 consistent with the Agency’s 4-part test to determine whether any provisions in the statute and/or regulation constitute new or revised WQS that the EPA has the authority and duty to approve or disapprove under the CWA section 303(c)(3). The 4-part test consists of the following questions:

1. Is it a legally binding provision adopted or established pursuant to state or tribal law?
2. Does the provision address designated uses, water quality criteria (narrative or numeric) to protect the designated uses, and/or antidegradation requirements for waters of the United States?
3. Does the provision express or establish the desired condition (e.g., uses, criteria) or instream level of protection (e.g., antidegradation requirements) for waters of the United States immediately or mandate how it will be expressed or established in such waters in the future?
4. Does the provision establish a new WQS or revise an existing WQS?

Question one is a threshold question of legal applicability that stems from the use of the terms “adopt,” “law,” “regulations,” and “promulgate” in CWA section 303(a)-(c) and the EPA’s regulations at 40 CFR 131.3(i) which specifies that WQS “are provisions of state or federal law.”³ Question two reflects the CWA articulation that WQS include three core components: designated uses, water quality criteria, and antidegradation requirements (see CWA sections 303(c)(2)(A) and 303(d)(4)(B)). Question three addresses the substance of the provision and whether it changes one or more of the components of a WQS, such that the provision expresses or establishes a different water quality goal for CWA purposes.⁴

Consistent with its placement as the final question, question four only needs to be evaluated if questions one through three are all answered in the affirmative. It clarifies that the EPA’s authority, as specified in CWA section 303(c)(2)(A), is to act only on new or revised WQS provisions, which includes provisions that have not previously been approved by EPA under section 303(c).⁵ The EPA’s evaluation of whether a provision is new or revised requires a consideration of the effect of the provision on the WQS themselves. For example, if a provision meets the first three considerations but already exists as part of the state or authorized tribe’s EPA-approved and CWA-applicable WQS and was only copied over to another section of the regulation for ease of reference, such a re-statement does not have the effect of establishing or changing the applicable WQS. Therefore, the provision is not new or revised, and the EPA does not have the authority or duty to take an action under CWA section 303(c).

Addressing question one, the SCWWA was passed by the South Carolina legislature and became effective on January 1, 2011, and is listed under Title 49 – Waters, Water Resources and Drainage under South Carolina Code of Laws. The SCDHEC promulgated rule R.61-119 in June 2012 to implement the legislation. Therefore, all provisions in the SCWWA and R.61-119 are legally binding and adopted pursuant to state law and satisfy question one of the EPA’s 4-part test.

³ 40 CFR 131.3(i): Water quality standards are provisions of State or Federal law which consist of a designated use or uses for the waters of the United States and water quality criteria for such waters based upon such uses. Water quality standards are to protect the public health or welfare, enhance the quality of water and serve the purposes of the Act.

⁴ See 40 CFR 131.2: A water quality standard defines the water quality goals of a water body, or portion thereof, by designating the use or uses to be made of the water and by setting criteria that protect the designated uses.

⁵ As stated in EPA’s 2012 4-part test FAQs “A provision that EPA has never approved as a WQS would be considered ‘new.’ It must also meet the other three considerations to be a new or revised WQS.” *What is a New or Revised Water Quality Standard Under CWA 303(c)(3)? Frequently Asked Questions*: Office of Water, U.S. Environmental Protection Agency. EPA No. 820-F-12-017 (October 2012) <https://www.epa.gov/sites/default/files/2014-11/documents/cwa303faq.pdf>

Addressing questions two and three, the EPA determined that the following provisions in the SCWWA and R.61-119 address water quality criteria and express the desired condition of all South Carolina surface waterbodies in terms of minimum instream flows, minimum water levels, and safe yields by creating new hydrologic criteria. In reaching this determination, the Agency analyzed the SCWWA and R.61-119, as explained below. Some of these provisions are included in both the SCWWA and R.61-119, while some provisions are in R.61-119 only. The EPA's analysis of how each provision meets questions 2 and 3 of the 4-part test is as follows:

- Minimum Instream Flow Provisions

Provision One: Waters Not Influenced by Impoundments

"Minimum instream flow" means the flow that provides an adequate supply of water at the surface water withdrawal point to maintain the biological, chemical, and physical integrity of the stream taking into account the needs of downstream users, recreation, and navigation and that flow is set at forty (40) percent of the mean annual daily flow for the months of January, February, March, and April; thirty (30) percent of the mean annual daily flow for the months of May, June, and December; and twenty (20) percent of the mean annual daily flow for the months of July through November for surface water withdrawers as described in Section 49-4-150(A)(1). [SCWWA section 49-4-20(14); R.61-119 section B(18)]

Provision Two: Waters Influenced by Impoundments

For surface water withdrawal points located on a surface water segment downstream of and influenced by a licensed or otherwise flow controlled impoundment, "minimum instream flow" means the flow that provides an adequate supply of water at the surface water withdrawal point to maintain the biological, chemical, and physical integrity of the stream taking into account the needs of downstream users, recreation, and navigation and that flow is set in Section 49-4-150(A)(3). [SCWWA section 49-4-20(14); R.61-119 section B(18)], and

For surface water withdrawal points located on a surface water segment downstream of and influenced by a licensed or otherwise flow controlled impoundment, the minimum instream flow shall be the flow specified in the license by the appropriate governmental agency. Surface water withdrawal points downstream of a licensed or otherwise flow controlled impoundment are considered to be influenced by the impoundment unless it can be demonstrated by the department through flow modeling and analysis of flow data that the withdrawal point is no longer materially influenced by the impoundment. The minimum instream flow set in this item does not apply to withdrawal points located downstream of an impoundment that are beyond the influence of the impoundment. [SCWWA section 49-4-150(A)(3); R.61-119 section E(3)(a)(i)(B)]

As noted above in section I.A. and as the EPA guidance explains, water quality criteria represent the conditions (e.g., concentrations of particular chemicals, levels of certain parameters, or narrative statements) sufficient to restore and maintain the chemical, physical, and biological integrity of water bodies, and protect applicable designated uses.⁶ The minimum instream flow provisions, by their plain language, establish levels for a physical parameter "to maintain the biological, chemical, and physical integrity of the stream" taking into account various uses. In doing so, the EPA concludes that they

⁶ U.S. Environmental Protection Agency (EPA). 2017. Water Quality Standards Handbook: Chapter 3: Water Quality Criteria. EPA-823-B-17-001. EPA Office of Water, Office of Science and Technology, Washington, DC. Accessed March 2022 at p. 1. <https://www.epa.gov/sites/production/files/2014-10/documents/handbook-chapter3.pdf>

establish new hydrologic criteria for state rivers and streams within the meaning of section 303(c) and the EPA's regulation. Therefore, they address water quality criteria to protect designated uses and satisfy the second question of the EPA's 4-part test.

The minimum instream flow provisions also satisfy the third question of the EPA's 4-part test because the provisions establish the desired condition for all rivers and streams in South Carolina, as described in more detail below.

Provision One sets a desired condition for minimum flows in rivers and streams not influenced by impoundments. These hydrologic criteria are based on a percentage of the mean annual daily flow of the river or stream.⁷ Specifically, the criteria are 40% of the mean annual daily flow for the months of January, February, March, and April; 30% of the mean annual daily flow for the months of May, June, and December; and 20% of the mean annual daily flow for the months of July through November. Provision One asserts that these mean annual daily flow percentages will provide an adequate supply of water to "maintain the biological, chemical, and physical integrity" of South Carolina's rivers and streams. This language tracks the CWA's section 101(a) objectives of restoring and maintaining the chemical, physical, and biological integrity of the Nation's waters. Provision One specifies that these minimum instream flows will take into account flows needed to support designated uses, specifically recreation and navigation, as well as the needs of downstream users, in a manner that is indistinguishable from how states must set WQS for waterbodies under CWA section 303(c)(2)(A). By setting flow amounts intended to maintain the chemical, physical, and biological integrity of South Carolina's waters and to protect the designated uses, the provision establishes the desired condition for the waters.

Provision Two sets a desired condition for minimum flows in rivers and streams influenced by impoundments for the same reasons. These hydrologic criteria establish the minimum instream flows specified in a license issued by the appropriate government agency. Similar to Provision One, Provision Two states that these minimum instream flows will provide an adequate supply of water to "maintain the biological, chemical, and physical integrity" of South Carolina's rivers and streams and will take into account flows needed to support designated uses, specifically recreation and navigation, as well as the needs of downstream users, in a manner that is indistinguishable from how states must set WQS for waterbodies under CWA section 303(c)(2)(A). By setting flow amounts intended to maintain the chemical, physical, and biological integrity of South Carolina's waters and to protect the designated uses, the provision establishes the desired condition for the waters.

In conclusion, these provisions satisfy the third question of the EPA's 4-part test because they establish a desired condition by setting a water quality goal for rivers and streams in South Carolina to maintain minimum instream flows, as defined by the SCWWA and R.61-119.

- Minimum Water Level Provision

"Minimum water level" means the water level in an impoundment necessary to maintain the biological, chemical, and physical integrity of the surface water in the impoundment taking into account downstream uses, withdrawals from the impoundment, and recreational and navigational needs as established by an existing federal regulatory process or established

⁷ Mean annual daily flow is defined as, "the arithmetic mean of individual daily mean discharges (stream flow) for a period representative of the historic stream flow records, using flow measurements published by USGS or as determined by other Department approved, hydrologically valid data." R.61-119 section B(16)

through consultation between the department and the operator of the impoundment. [SCWWA section 49-4-20(15); R.61-119 section B(19)]

Like the minimum instream flow provisions, the minimum water level provision establishes levels for a physical parameter explicitly for the purpose of protecting uses. In doing so, it establishes new hydrologic criteria for impoundments. Therefore, this provision addresses water quality criteria to protect designated uses and satisfy the second question of the EPA's 4-part test.

The minimum water level provision also establishes, by its plain language, the desired condition for impoundments in South Carolina by setting a minimum water level intended to "maintain the biological, chemical, and physical integrity" of South Carolina impoundments. These hydrologic criteria are set by relying on the water levels established through existing regulatory processes or through consultation between the Department and the impoundment operator. The minimum water level provision states that these water levels will "maintain the biological, chemical, and physical integrity" of South Carolina's impoundments, tracking the language of the CWA's section 101(a) objectives, and will take into account downstream users and designated uses, specifically recreation and navigation, in a manner that is indistinguishable from how states must set WQS for waterbodies under CWA section 303(c)(2)(A). By setting water levels intended to maintain the chemical, physical, and biological integrity of South Carolina's waters and to protect the designated uses, the provision establishes the desired condition for the waters. In conclusion, this provision also satisfies the third question of the EPA's 4-part test because it establishes the desired condition by setting a water quality goal for impoundments in South Carolina to maintain minimum water levels, as defined by the SCWWA and R.61-119.

- Safe Yield Provision

"Safe yield" means the amount of water available for withdrawal from a particular surface water source in excess of the minimum instream flow or minimum water level for that surface water source. Safe yield is determined by comparing the natural and artificial replenishment of the surface water to the existing or planned consumptive and nonconsumptive uses. [SCWWA section 49-4-20(25); R.61-119 section B(29)]

The safe yield provision establishes new hydrologic criteria for all South Carolina waters in the same manner as the minimum instream flow and minimum water level provisions, expressed as the inverse or the "safe" amount of water that is available for withdrawal. Therefore, it addresses water quality criteria to protect designated uses and satisfies the second question of the EPA's 4-part test.

The safe yield provision also establishes the desired condition for all waters in South Carolina by establishing the amount of water that remains available for withdrawal in excess of the applicable minimum instream flow or minimum water level. As previously noted, the minimum instream flow and minimum water level provisions set desired conditions for the minimum amounts of water intended to "maintain the biological, chemical, and physical integrity" of South Carolina's waters, while also taking into account downstream users and designated uses, specifically recreation and navigation. The safe yield provision also expresses those same instream flow and water level desired conditions by establishing the amount of water that can be withdrawn while still supporting the instream flow or water level. The safe yield provision is the inverse of the minimum instream flow and minimum water level provisions and therefore, this safe yield provision is similarly tied to the maintenance of the chemical, physical, and biological integrity of South Carolina's waters and protection of designated uses. By setting withdrawal amounts that are intended to be safe or protective, the provision is setting the desired condition. In conclusion, the safe yield provision satisfies the third question of the EPA's 4-part test

because it establishes the desired condition by setting a water quality goal for all surface waters in South Carolina to maintain minimum instream flows and minimum water levels, as defined by the SCWWA and R.61-119.

- Additional Safe Yield Provisions

For withdrawals in a stream segment not influenced by a licensed or otherwise flow controlled impoundment, the safe yield is calculated as the difference between the mean annual daily flow and twenty (20) percent of mean annual daily flow at the withdrawal point, taking into consideration natural and artificial replenishment of the surface water and affected downstream withdrawals. [R.61-119 section E(3)(a)(ii)(A)]

For withdrawals located on a stream segment materially influenced by a license or otherwise flow controlled impoundment, the safe yield is calculated as the difference between mean annual daily flow and the lowest designated flow in the license specified for normal conditions (non-drought) taking into consideration natural and artificial replenishment of the surface water and affected downstream withdrawals and natural attenuation of the stream flow between the licensed or otherwise flow controlled impoundment and the surface water withdrawal point. [R.61-119 section E(3)(a)(ii)(B)]

For withdrawals from a licensed or otherwise flow controlled impoundment, safe yield is calculated as the maximum amount that would not cause a reservoir water level to drop below its minimum water level or to be able to release the lowest minimum flow specified in the license for that impoundment as issued by the appropriate governmental agency. [R.61-119 section E(3)(a)(ii)(C)]

For withdrawals from an impoundment that is not considered a licensed or otherwise flow controlled impoundment under this regulation, the safe yield is calculated as the maximum amount that would not cause the impoundment water level to drop below its minimum water level as established by the Department with input from the applicant and the owner(s) and operator(s) of the impoundment consistent with E.3.i(C)(2) above. [R.61-119 section E(3)(a)(ii)(D)]

These additional safe yield provisions, which are found only in R.61-119, establish new hydrologic criteria for all South Carolina waters in the same manner as the minimum instream flow and minimum water level provisions, expressed as the inverse or the “safe” amount of water that is available for withdrawal. Therefore, they address water quality criteria to protect designated uses and satisfy the second question of the EPA’s 4-part test.

These safe yield provisions also establish the desired condition for all waters in South Carolina and further elaborate on the more general safe yield definition in the SCWWA by establishing the amount of water that remains available for withdrawal as follows:

- The difference between the mean annual daily flow and twenty (20) percent of mean annual daily flow, for streams not influenced by a licensed or otherwise flow controlled impoundment; *or*
- The difference between the mean annual daily flow and the lowest flows specified in an operational license during non-drought conditions, for rivers and streams influenced by impoundments; *or*

- The maximum amount that would not cause an impoundment to go below its minimum water level or the ability to release the minimum flow specified in its license, for licensed or otherwise flow controlled impoundments; *or*
- The maximum amount that would not cause an impoundment to go below its minimum water level as established by the Department with input from the applicant and the owner(s) and operator(s) of the impoundment, for impoundments that are not considered licensed or otherwise flow controlled.

As previously noted, the minimum instream flow and minimum water level provisions set desired conditions for the minimum amounts of water intended to “maintain the biological, chemical, and physical integrity” of South Carolina waters, while also taking into account downstream users and designated uses, specifically recreation and navigation. These safe yield regulatory provisions also express those same instream flow and water level desired conditions by establishing the amount of water that can be withdrawn and still support the instream flow or water level. By stating how much water can be withdrawn, these safe yield provisions are the inverse of the minimum instream flow and minimum water level provisions and therefore, these safe yield provisions are similarly tied to the maintenance and protection of the chemical, physical, and biological integrity of South Carolina’s waters and protection of designated uses. By setting withdrawal amounts that are intended to be safe or protective, the provisions are setting the desired condition. In conclusion, these safe yield provisions satisfy the third question of the EPA’s 4-part test because they establish the desired condition by setting a water quality goal for all surface waters in South Carolina to maintain minimum instream flows and minimum water levels, as defined by the SCWWA and R.61-119.

Finally, addressing question four of the 4-part test, all the provisions analyzed above satisfy the first three questions and have not been previously approved by the EPA under section 303(c).⁸ They are therefore all new WQS that satisfy the fourth question of the EPA’s 4-part test.

Therefore, all four questions are answered “yes,” and, as such, the EPA has concluded that the provisions are new WQS that the EPA has the authority and duty to approve or disapprove under CWA section 303(c)(3).

II. Step 2. Review of Provisions Found to be New WQS for Consistency with the CWA and Implementing Regulation

CWA section 303(c)(3) provides that the EPA will either approve or disapprove new or revised WQS, based on whether the WQS are “consistent with the applicable requirements” of the CWA. The EPA’s regulations provide for the Regional Administrator to notify the state that the WQS are either approved or disapproved. (40 CFR section 131.21(a)). As specified in 40 CFR section 131.21(b), the Regional Administrator’s action is to be based on the requirements of the CWA as described by the implementing regulation at 40 CFR sections 131.5 and 131.6. Those provisions refer to additional portions of 40 CFR Part 131, including sections 131.10 and 131.11. According to 40 CFR section 131.11(a), “States must adopt those water quality criteria that protect the designated use. Such criteria must be based on sound

⁸ As stated in the EPA’s 2012 4-part test FAQs “A provision that the EPA has never approved as a WQS would be considered ‘new.’ It must also meet the other three considerations to be a new or revised WQS.” *What is a New or Revised Water Quality Standard Under CWA 303(c)(3)? Frequently Asked Questions.* Office of Water, U.S. Environmental Protection Agency. The EPA No. 820-F-12-017 (October 2012) <https://www.epa.gov/sites/default/files/2014-11/documents/cwa303faq.pdf>

scientific rationale and must contain sufficient parameters or constituents to protect the designated use.” Furthermore, 40 CFR 131.10(b) provides that “In designating uses of a water body and the appropriate criteria for those uses, the State shall take into consideration the water quality standards of downstream waters and shall ensure that its water quality standards provide for the attainment and maintenance of the water quality standards of downstream waters.” In brief, the EPA finds that these new hydrologic criteria do not meet the requirements of the CWA, or 40 CFR Part 131 and these provisions are disapproved for all purposes under the CWA.

As described in Section E below - Scientific Background - scientific information on the hydrologic conditions necessary to support aquatic life has evolved considerably over the past several decades. This science has documented the detrimental impacts that alterations of flow in a waterbody can have on aquatic life, such as degrading species distribution and abundance and altering the composition and diversity of aquatic communities. For example, when flows decrease, pollutant concentrations, sedimentation, water temperature, and salinity in downstream waters can increase and dissolved oxygen levels can decrease. Nutrients, pH, and other parameters are also impacted by flow alterations. Increases in temperature due to extreme reductions of flow from withdrawals during the critical summer low flow period can cause detrimental biological impacts. The detrimental effects that can be associated with decreased flows, including on downstream waters, are explained more fully in Section E.

The information summarized in Section E informs but does not dictate the outcome of the EPA’s evaluation of whether the new WQS identified in section I are consistent with the requirements of section 303(c) and the EPA’s regulations. However, a wealth of scientific information has documented the detrimental impacts that reduction in flow can have on the integrity of waters, and this science has informed the Agency’s analysis as to whether SCWWA and R.61-119 meet applicable legal requirements, in particular whether the provisions are based on sound science and protect designated uses. 40 C.F.R. 131.11(a). The EPA’s review has taken into account, in particular, whether the degree of flow reduction associated with the desired condition of the waterbody set by the State’s criteria would protect designated uses. As explained below, based on the record before the Agency, the EPA discerns no sound scientific rationale supporting the State’s hydrologic criteria and concludes that the detrimental effects associated with the reduction in flow and water levels allowed by the State’s criteria do not protect the designated uses contained in South Carolina’s approved WQS. *See, e.g.,* SCDHEC WQS at R.61-68F.1.e (“all water use classifications protect for a balanced indigenous aquatic community of fauna and flora.”).

A. Review of Minimum Instream Flow Provisions

South Carolina set hydrologic criteria for minimum instream flow for waters not influenced by impoundments (Minimum Instream Flow Provisions: Provision One) as percentages of the mean annual daily flow for specific months. The mean annual daily flow is a single calculated value that does not reflect the variability in flow levels that occurs during the year. As such, it does not represent the actual water present in a river or stream at any given point in time. For example, in using a mean annual daily flow the high spring flows are flattened and averaged out with the summer low flows to get a single calculated value, reflecting lower flows than are present in the spring and a higher flow value than would actually occur in the summer or early fall.

Specific percentages of the mean annual daily flow are set for different time periods as the amount of water that must remain instream to protect the integrity of the waters and protect the designated uses. The minimum amount that is required to remain in the waterbody is 40% of the mean annual daily flow

for the months of January, February, March, and April; 30% of the mean annual daily flow for the months of May, June, and December; and 20% of the mean annual daily flow for the months of July through November. Requiring those amounts to remain in the waterbody conversely means that 60% of the mean annual daily flow can be withdrawn for the months of January, February, March, and April; 70% of the mean annual daily flow can be withdrawn in May, June, and December; and 80% of the mean annual daily flow can be withdrawn in July through November. However, because the mean annual daily flow does not reflect how much water is actually in the waterbody at any given time, this could result in the removal of even higher percentages of the actual flow that occurs on any given day. There is no supporting evidence that removal of these percentages of the mean annual daily flow, as well as the flattening of the hydrograph that would occur if these water volumes were withdrawn throughout the year, would maintain the biological, chemical, and physical integrity of rivers and streams. To the contrary, published studies (e.g., Arthington 2006; Richter, 2010)⁹ indicate that the significant alterations allowed by these criteria would almost certainly result in significant ecological degradation and therefore not protect designated uses.¹⁰

The minimum instream flow criteria for locations on rivers and streams influenced by impoundments (Minimum Instream Flow Provisions: Provision Two) are the flows specified in the license by the appropriate governmental agency. The process of negotiating a license may or may not address any impacts to the aquatic community, fishing, or recreation. Any minimum flows and levels resulting from such negotiations may be set based on a review of other community, industrial, or business goals and endpoints rather than any scientific rationale or protection of the applicable designated uses. These processes are not inherently designed to use a sound scientific method or model based on protecting a balanced indigenous aquatic community, as required by the designated uses in South Carolina's approved WQS. Nor is there supporting evidence that such licenses in South Carolina—which appear unconstrained from a water quality perspective—in fact specify flows that maintain the biological, chemical, and physical integrity of the river or stream.

In summary, the minimum instream flow hydrologic criteria set under the SCWWA and R.61-119 allow significant reduction of flows without any discernible sound scientific rationale and do not protect designated uses for waters to which they apply. The criteria therefore fail to meet the requirements of 40 CFR section 131.11.

B. Review of Minimum Water Level

South Carolina set hydrologic criteria for minimum water level for impoundments as established by an existing federal regulatory process or established through consultation between the Department and the operator of the impoundment. These processes may include updates to water control manuals or negotiated stakeholder agreements such as through the Federal Energy Regulatory Commission (FERC) licensing process or through other stakeholder negotiated processes for determining impoundment levels and minimum releases downstream of impoundments. As with the minimum instream flow provision for locations on rivers and streams influenced by impoundments, existing federal regulatory processes or consultations between the Department and impoundment operators may or may not address any impacts

⁹ Arthington, A.H., Bunn, S.E., Poff, N.L. and Naiman, R.J. (2006). The Challenge of Providing Environmental Flow Rules to Sustain River Ecosystems. *Ecological Applications* 16: 1311-1318. [https://doi.org/10.1890/1051-0761\(2006\)016\[1311:TCOPEF\]2.0.CO;2](https://doi.org/10.1890/1051-0761(2006)016[1311:TCOPEF]2.0.CO;2) ; Richter, B.D. (2010) Re-thinking environmental flows – From allocations and reserves to sustainability boundaries. *River Research and Applications* 28(8): 1052–1063. <http://dx.doi.org/10.1002/rra.1320>.

¹⁰ To be clear, these studies cited as examples did not evaluate the specific percentages identified in South Carolina's statute and rules, nor South Carolina streams. These studies summarized the scientific literature and reached common conclusions related to flow alterations that are comparable or actually less altering than those identified in South Carolina's criteria.

to the aquatic community, fishing, or recreation. These processes are not inherently designed to use a sound scientific method or model based on protecting a balanced indigenous aquatic community, as required by the designated uses in South Carolina's approved WQS. Nor is there supporting evidence that such processes or consultations in South Carolina—which appear unconstrained from a water quality perspective—will in fact result in specification of levels that are based on sound scientific rationale or protect designated uses to which the criteria apply. The criteria therefore fail to meet the requirements of 40 CFR section 131.11.

C. Review of Safe Yield Provisions

Safe yield (or the amount of water that is considered 'safe' to withdraw) for rivers and streams not influenced by impoundments, is defined by the regulatory provision R.61-119 section E(3)(a)(ii)(A) as the difference between the mean annual daily flow and 20% of the mean annual daily flow at the withdrawal point. That is, the amount that is allowed to be withdrawn would be 80% of the mean annual daily flow throughout the year. Because the mean annual daily flow is a statistical value not correlated to how much water is actually in the waterbody at any given time, this could result in a calculated safe yield that is greater than the amount of water in a river or stream at certain times of the year. In those instances where a withdrawer is only subject to the safe yield provision and not required to meet minimum instream flow, there are no minimum amounts of water required to be left instream. Therefore, withdrawing the entire safe yield could allow removal of all the water in a waterbody during some times of the year, which would not maintain and support aquatic life. The potential to remove all water was acknowledged in comments by the South Carolina Department of Natural Resources,¹¹ which found that "for most streams, this 'safe yield' is greater than the median flow, meaning that the 'safe yield' will not be available more than half of the time." Since median flow is statistically the 50th percentile of a distribution of daily flow values, if the "safe yield" exceeds this median, then it could allow removal of all the water more than half the number of days in the year.

Safe yield for waterbodies influenced by impoundments or other flow control structures – as well as for impoundments themselves – is established by deferring to the minimum flows and levels specified through license agreements by the appropriate governmental agency, an existing federal regulatory process, or established through consultation between the Department and the operator of the impoundment. As stated above, these processes may include updates to water control manuals or negotiated stakeholder agreements such as through the FERC licensing process or through other stakeholder negotiated processes for determining impoundment levels and minimum releases downstream of impoundments.

The process of negotiating a license or operational agreement, the process of updating a water control manual, or the consultation process between the Department and the impoundment operator may or may not address impacts to the aquatic community, fishing, or recreation. In using such processes, any included minimum flows or levels may be set based on a review of other community, industrial, or business goals and endpoints rather than scientific rationale or protection of the designated uses. These processes are not inherently designed to use a sound scientific method or model based on protecting a balanced indigenous aquatic community, as required by the designated uses in South Carolina's approved WQS. Nor is there supporting evidence that such licenses, operational agreements, manuals, or consultations in South Carolina - which appear unconstrained from a water quality perspective - will in

¹¹ South Carolina Department of Natural Resources Comments on Proposed DHEC Surface Water Regulations R.61-119, *Surface Water Withdrawal, Permitting, Use and Reporting Act* version July 14, 2011. Submitted September 26, 2011.

fact result in specification of flows or levels that are based on sound scientific rationale or protect designated uses.

In summary, the safe yield hydrologic criteria set under the SCWWA and R.61-119 allow significant alteration of flows without any discernible sound scientific rationale for those criteria; nor do they protect designated uses for waters to which they apply. The criteria therefore fail to meet the requirements of 40 CFR section 131.11.

D. Consideration of WQS in Downstream Waters

In designating uses of a water body and the appropriate criteria for those uses, the State shall “take into consideration the water quality standards of downstream waters and shall ensure that its water quality standards provide for the attainment and maintenance of the water quality standards of downstream waters.” (40 CFR 131.10(b)). As stated in the EPA’s guidance, *Protection of Downstream Waters in Water Quality Standards: Frequently Asked Questions*¹² (*Downstream FAQs*), developing water quality criteria that ensure attainment and maintenance of downstream WQS may help to avoid situations where downstream segments become impaired due in part to, or directly because of, pollution in upstream segments. The *Downstream FAQs* note that states should consider waterbodies that “flow to downstream waters and may affect hydrologic flow...” and that “[d]ownstream impacts of upstream uses and criteria should be considered as far downstream as adverse impacts are observed or expected to occur from upstream pollution (including hydrologic flow alteration.)”

South Carolina’s minimum instream flow, minimum water level, and safe yield provisions include language that references protection of downstream uses. However, the record before the EPA does not contain any support for concluding that the State took into consideration WQS for downstream waters or that the hydrologic criteria will, in fact, “provide for the attainment and maintenance of the water quality standards of downstream waters.” (40 CFR 131.10(b)). As discussed above, the significant reductions in flow allowed by the criteria will almost certainly result in significant ecological degradation and therefore not protect designated uses for the waters to which the criteria apply. Similarly, such significant flow reductions can also result in substantial adverse downstream impacts. As described in the Scientific Background section, downstream bays and estuaries are dependent upon a characteristic pattern of freshwater flows from rivers and streams to support their aquatic life - affecting all levels of physical, chemical, and biological functions. Reduction of upstream flows at the levels allowed under these criteria could cause increases in salinity, exacerbate the effects of sea-level rise, and can adversely affect ecological function in saltwater systems¹³ such as those classified Shellfish Harvesting Waters, Class SA, and Class SB waters. There is no basis to conclude that, in adopting the hydrologic criteria, South Carolina considered the WQS for downstream waters or that the criteria will provide for the attainment and maintenance of the WQS of downstream waters, as required by 40 CFR section 131.10(b).

¹² *Protection of Downstream Waters in Water Quality Standards: Frequently Asked Questions*. EPA 820-F-14-001. U.S. Environmental Protection Agency. Office of Water, June 2014. <https://www.epa.gov/sites/default/files/2018-10/documents/protection-downstream-wqs-faqs.pdf>

¹³ Copeland, B. J. 1966. Effects of decreased river flow on estuarine ecology. *Journal of Water Pollution Control Federation* 38:1831–1839; Powell, G.L., Matsumoto, J., and Brock, D.A. 2002. Methods for Determining Minimum Freshwater Inflow Needs of Texas Bays and Estuaries. *Estuaries* 25(6B): 1262–1274

E. Scientific Background

Scientific information on the hydrologic conditions necessary to support aquatic life has evolved considerably over the past several decades.¹⁴ This science has documented the detrimental impacts that alterations of flow in a waterbody can have on aquatic life, such as degrading species distribution and abundance and altering the composition and diversity of aquatic communities.¹⁵ Scientific evidence has supported the importance of a waterbody's characteristic flow pattern (including magnitude, timing, duration, frequency, and rate of change), or natural flow regime, for sustaining aquatic life; the dependence of downstream lake, bay, and estuary health on characteristic patterns of freshwater inputs; and the utility of a Sustainable Boundary Approach or Percentage of Flow approach as one possible method for developing general hydrologic standards that are protective of aquatic life.

To assist states and tribes in developing criteria, the EPA publishes, from time to time, information on the factors necessary to restore and maintain the chemical, physical, and biological integrity of all waters and the factors necessary for the protection and propagation of shellfish, fish, and wildlife and to allow recreation on the water. (CWA 304(a)(2)). In addition, from time to time, the EPA provides states and tribes with information on the processes, procedures, and methods to control pollution, defined as “the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water,” (CWA section 502(19)). The CWA specifies that this includes pollution caused by the changes in the movement, flow, or circulation of any navigable waters or groundwaters, including changes caused by the construction of dams, levees, channels, causeways, or flow diversion facilities. (CWA 304(f)).

Most recently, consistent with sections 304(a)(2) and 304(f) of the CWA, and in conjunction with the United States Geological Survey (USGS), the EPA published the *Final EPA-USGS Technical Report: Protecting Aquatic Life from Effects of Hydrologic Alteration*¹⁶ (EPA-USGS Technical Report) to provide scientific information that states, and tribes could use in their efforts to advance the protection of aquatic life from the adverse effects of this type of pollution in rivers and streams. The *EPA-USGS Technical Report* includes information that the states and tribes are encouraged to use to develop and implement scientifically sound, protective hydrologic criteria, as well as potential means of addressing these protections through other CWA programs. It is a non-binding document and does not mandate any particular approach, but rather presents a literature review, examples of narrative criteria that some states and tribes have adopted, and a flexible, non-prescriptive framework for identifying biological goals and evaluating effects on aquatic life under varying degrees of flow alteration.

¹⁴ Arthington, A.H., Bunn, S.E., Poff, N.L. and Naiman, R.J. (2006). The Challenge of Providing Environmental Flow Rules to Sustain River Ecosystems. *Ecological Applications* 16: 1311-1318. [https://doi.org/10.1890/1051-0761\(2006\)016\[1311:TCOPEF\]2.0.CO;2](https://doi.org/10.1890/1051-0761(2006)016[1311:TCOPEF]2.0.CO;2) ; Novak, R., et al. 2016. *Final EPA-USGS Technical Report: Protecting Aquatic Life from Effects of Hydrologic Alteration*: U.S. Geological Survey Scientific Investigations Report 2016–5164, U.S. Environmental Protection Agency EPA Report 822-R-156-007, 156 p. <https://www.epa.gov/sites/default/files/2016-12/documents/final-aquatic-life-hydrologic-alteration-report.pdf> ; Poff, N.L., Allan, J.D., Bain, M.B., Karr, J.R., Prestegard, K.L., Richter, B.D., Sparks, R.E., and Stromberg, J.C. (1997). The Natural Flow Regime A paradigm for river conservation and restoration. *BioScience* 47(11): 769-784.; Richter, B.D. 2010. Re-thinking environmental flows – From allocations and reserves to sustainability boundaries. *River Research and Applications* 28(8): 1052–1063. <http://dx.doi.org/10.1002/rra.1320> .

¹⁵ Bunn, S.E., and Arthington, A.H. 2002. Basic principles and ecological consequences of altered flow regimes for aquatic biodiversity. *Environmental Management* 30(4): 492–507. <http://dx.doi.org/10.1007/s00267-002-2737-0>.

¹⁶ Novak, R., et al. 2016. *Final EPA-USGS Technical Report: Protecting Aquatic Life from Effects of Hydrologic Alteration*: U.S. Geological Survey Scientific Investigations Report 2016–5164, U.S. Environmental Protection Agency EPA Report 822-R-156-007, 156 p. <https://www.epa.gov/sites/default/files/2016-12/documents/final-aquatic-life-hydrologic-alteration-report.pdf>

Based on the results of a contemporary environmental flow¹⁷ literature search, the *EPA-USGS Technical Report* found that “[p]rotecting aquatic life from the effects of flow alteration involves maintaining multiple components of the flow regime within their typical range of variation.” The study of how the ecology of aquatic ecosystems changes in relationship to flow (flow-ecology) has demonstrated that aquatic life depends on each of the components of a natural flow regime reflecting the natural variation of flow conditions over space and time. The study of flow-ecology seeks to create linkages and define the relationship between alterations in flow and ecological responses.¹⁸ This characteristic flow pattern, or natural flow regime, supports the integrity of aquatic life by maintaining habitat of sufficient size, character, diversity, and connectivity as well as providing cues for spawning, migration, and other life history stages. Restoring and maintaining a natural flow regime has also been shown to increase system resilience to climate change.¹⁹

Conversely, alteration of a natural flow regime can have cascading effects on the physical, chemical, and biological properties of waterbodies, which can lead to the degradation of aquatic life. For example, when flows decrease, pollutant concentrations, sedimentation, water temperature, and salinity in downstream waters can increase and dissolved oxygen levels can decrease. Nutrients, pH, and other parameters are also impacted by flow alterations. Increases in temperature due to extreme reductions of flow from withdrawals during the critical summer low flow period can cause detrimental biological impacts.²⁰ Reductions in flow alter lateral and longitudinal hydrologic connectivity, resulting in the reduction of survival of migratory fish, loss of high-quality habitat, and impacts to adjacent riparian areas. The loss of access to floodplains limits access to important reproduction and feeding areas, refugia, and rearing habitat for native species. More frequent low-flow conditions can reduce sensitive taxa diversity and abundance, and cause mortality. Altering of flows can remove the flow and temperature cues needed for aquatic species to complete their life cycles, eliminating the hydrologic cues needed to stimulate spawning. This has been shown to increase the establishment of invasive species. The most severe of alterations, when stream segments are dewatered, will result in the complete extirpation of aquatic species in those waterbodies.²¹

Similarly, downstream bays and estuaries are dependent upon a characteristic pattern of freshwater flows from rivers and streams to support their aquatic life - affecting all levels of physical, chemical, and

¹⁷ “Environmental flows describe the quantity, timing, and quality of water flows required to sustain freshwater and estuarine ecosystems and the human livelihoods and well-being that depend on these ecosystems... Environmental flows are essential for freshwater ecosystem health and human well-being.” The Brisbane Declaration on Environmental Flows (2007).

<https://riversymposium.com/about/brisbane-declaration/>

¹⁸ Poff, L.N. *et al.* 2010, The ecological limits of hydrologic alteration (ELOHA) – A new framework for developing regional environmental flow standards. *Freshwater Biology* 55(1): 147–170.

¹⁹ Novak, R., *et al.* 2016. *Final EPA-USGS Technical Report: Protecting Aquatic Life from Effects of Hydrologic Alteration*: U.S. Geological Survey Scientific Investigations Report 2016–5164, U.S. Environmental Protection Agency EPA Report 822-R-156-007, 156 p. <https://www.epa.gov/sites/default/files/2016-12/documents/final-aquatic-life-hydrologic-alteration-report.pdf> ; Palmer, M.A., Lettenmaier, D.P., Poff, N.L., Postel, S.L., Richter, B.D., and Warner, R. 2009. Climate change and river ecosystems – Protection and adaptation options. *Environmental Management* 44(6): 1053–1068.

<http://dx.doi.org/10.1007/s00267-009-9329-1> ; U.S. Global Change Research Program. 2018. *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II*. [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. Global Change Research Program, Washington, DC, USA. 1515 pp. <http://dx.doi.org/10.7930/NCA4.2018>

²⁰ Novak, R., *et al.* 2016. *Final EPA-USGS Technical Report: Protecting Aquatic Life from Effects of Hydrologic Alteration*: U.S. Geological Survey Scientific Investigations Report 2016–5164, U.S. Environmental Protection Agency EPA Report 822-R-156-007, 156 p. <https://www.epa.gov/sites/default/files/2016-12/documents/final-aquatic-life-hydrologic-alteration-report.pdf>

²¹ *Id.*

biological functions.²² Characteristic timing and delivery of freshwater flows are critical for estuarine circulation patterns, salinity gradients, sediment transport, temperature, oxygen levels, and nutrient supplies.²³ These processes support habitat and nursery areas, sea grass beds, spawning, and the maintenance of species composition and abundance.²⁴ The timing and delivery of upstream freshwater flows has been identified as a major factor for bay and estuary biological productivity, such as shellfish harvesting and fisheries. Anthropogenic reductions of flow, and changes to the timing and delivery of freshwater flows, can create hypersaline conditions, change habitat, and drastically alter estuarine species composition.²⁵ Lakes have also adapted to hydrologic conditions to support aquatic life. Significant alterations of input flows can impact fishing and recreational uses.

Numerous approaches can be used to develop scientifically defensible site-specific hydrologic criteria, but this process can be time-consuming. Over the past 20 years, when more general approaches have been needed, hydrologic standards have increasingly been based on a Sustainable Boundary Approach or a Percentage of Flow approach, which preserves characteristic flow patterns that support aquatic life by allowing ecologically sustainable deviations from natural conditions.²⁶ These deviations from natural conditions are based on short time steps and have been found to be more protective than a minimum instream flow standard alone.²⁷

III. EPA Action

For the reasons stated above, the EPA finds that the provisions for minimum instream flow, minimum water level, and safe yield constitute new WQS that the EPA has the authority and duty to approve or disapprove under CWA section 303(c)(3). Based on its review, the EPA concludes that these provisions are not consistent with the CWA or its implementing regulation. Specifically, they are not based on a sound scientific rationale, do not protect the State's designated uses, and do not provide for the attainment and maintenance of downstream WQS. *See* 40 CFR sections 131.5, 131.10(b), and 131.11(a)(1). Therefore, the EPA disapproves these provisions because they do not comply with the requirements of the CWA and 40 CFR Part 131.

A. Effect of Disapproval

While the disapproved provisions remain in effect for state law purposes, under 40 CFR section 131.21(e), these provisions are not in effect under the CWA and cannot be used for any CWA purpose, including but not limited to: any certification issued pursuant to section 401 of the CWA (e.g.,

²² Copeland, B. J. 1966. Effects of decreased river flow on estuarine ecology. *Journal of Water Pollution Control Federation* 38:1831–1839; Powell, G.L., Matsumoto, J., and Brock, D.A. 2002. Methods for Determining Minimum Freshwater Inflow Needs of Texas Bays and Estuaries. *Estuaries* 25(6B): 1262–1274.

²³ Powell, G.L., Matsumoto, J., and Brock, D.A. 2002. Methods for Determining Minimum Freshwater Inflow Needs of Texas Bays and Estuaries. *Estuaries* 25(6B): 1262–1274.

²⁴ Alber, M. 2002. A Conceptual Model of Estuarine Freshwater Inflow Management. *Estuaries* 25(6B): 1246–1261.; Harte Research Institute for Gulf of Mexico Studies. 2014. Freshwater Inflows. <https://www.freshwaterinflow.org/introduction/>

²⁵ Copeland, B. J. 1966. Effects of decreased river flow on estuarine ecology. *Journal of Water Pollution Control Federation* 38: 1831–1839; Alber, M. 2002. A Conceptual Model of Estuarine Freshwater Inflow Management. *Estuaries* 25(6B): 1246–1261.

²⁶ Richter, B.D. 2010. Re-thinking environmental flows – From allocations and reserves to sustainability boundaries. *River Research and Applications* 28(8): 1052–1063. <http://dx.doi.org/10.1002/rra.1320>; Driver, L.J., Cartwright, J.M., Knight, R.R., and Wolfe, W.J. 2020. Species-Richness Responses to Water-Withdrawal Scenarios and Minimum Flow Levels: Evaluating Presumptive Standards in the Tennessee and Cumberland River Basins. *Water* 12(5): 1334. <https://doi.org/10.3390/w12051334>

²⁷ Richter, B.D. 2010. Re-thinking environmental flows – From allocations and reserves to sustainability boundaries. *River Research and Applications* 28(8): 1052–1063. <http://dx.doi.org/10.1002/rra.1320>

certification related to permits issued by the Army Corps of Engineers under section 404 of the CWA or issuance of licenses by the FERC); identification of impaired waters under sections 303(d) and 305(b) of the CWA, or issuance of NPDES permits under section 402 of the CWA.

B. Remedy

To remedy the Agency's disapproval and protect the state's designated and existing uses, South Carolina must adopt hydrologic criteria that are consistent with the requirements of the CWA and the EPA's implementing regulation and submit them to the EPA pursuant to section 303(c) and 40 CFR 131.22.²⁸ The EPA strongly encourages South Carolina to consider the scientific information summarized in this document and in the documents cited herein to assist in this regard. Consistent with 40 CFR 131.6(b), the State must submit to the EPA the methods and analyses conducted to support such criteria. The hydrologic criteria must be based on sound scientific rationale, sufficient to protect the applicable designated uses, take into consideration the WQS of downstream waters, and provide for the attainment and maintenance of such downstream standards. The hydrologic criteria must be consistent with the antidegradation policy requirements in 40 CFR section 131.12. *See* 40 CFR sections 131.5, 131.6, 131.10, 131.11, and 131.12.

Once hydrologic criteria are adopted by the State and approved by the EPA, they will apply, in conjunction with the SCDHEC's CWA effective WQS under R.61-68 and 69, for CWA purposes, including but not limited to section 401 certifications, section 402 NPDES permits, any other CWA permitting or reviews, and assessment of state water quality under sections 303(d) and 305(b). The EPA welcomes the opportunity to work with the Department on the development of these WQS consistent with the CWA and 40 CFR Part 131 and informed by relevant guidance.

IV. Provisions in SCWWA and R.61-119 EPA is Not Acting on Under CWA 303(c)(3)

EPA determined that it does not have the authority or duty to act on any of the remaining provisions in the SCWWA and R.61-119 under CWA section 303(c)(3). In brief, after careful review, the EPA has concluded that the provisions either do not meet all 4 questions of the 4-part test or they are definitions that are not at this time defining terms in any EPA-approved, CWA-effective WQS. These state law provisions remain in effect in South Carolina but may not be used for CWA purposes because they are not approved by the EPA.

Date

Daniel Blackman
Regional Administrator

²⁸ Response to public comments during the 2019 Triennial review, "The Department recognizes the importance of stream flow protection. The Department is currently working to determine appropriate narrative stream flow standards. Following this Triennial Review, the Department plans to initiate a separate rulemaking process focused on stream flow standards" SCDHEC to EPA, March 2021.